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**FOOD DISPENSER**

This application claims priority from GB Patent Application Number 0819220.5 on Oct. 21, 2008.

**FIELD OF THE INVENTION**

The present invention relates generally to food dispensers and, more particularly, to an automatic dry food dispenser for feeding animals.

**BACKGROUND**

Automatic food dispenser for feeding animals, such as automatic dispensers specifically designed for pet animals, as well as the more sturdy type designed for industrial husbandry, are known in the art and are useful for automatically dispensing food material, such as pelletized or powdered dry food to animals.

Such automatic food dispensers of the prior art generally comprise three main elements: a container, or hopper compartment, for temporarily storing the dry food to be dispensed to the intended animal, a power driven feed transfer chamber for dispensing a metered amount, or ration, of dry food on a timely basis, and a conveying means for conveying the dispensed ration to a suitable receptacle such as a feed bowl. The feed transfer chamber generally comprises a rotating element such as, for examples, a rake, a daisy wheel, an auger, or the like, that dispenses dry food from an input port in communication with the hopper compartment, to an output port in communication with the conveying means.

While these prior art devices generally offer an automatic food dispenser for dispensing dry food to animals, they also entail one or more of the following disadvantages:

a) they are generally specifically adapted for only one type of dry food material for animals, either pelletized or powdered/granulated dry food;

b) their mode of operation for dispensing predetermined amount of feed is generally based on a timed operation of a rotating element within the dispenser, and without monitoring means on the actual dispensing of the food;

c) they are generally not readily designed to be quickly and easily disassembled for periodic cleaning. Thus, moisture trapped in dry food dust accumulated in compact mechanical assemblies of the dispenser is prone to develop mould, a generally unacceptable problem in industrial husbandry of animals destined for human consumption.

Against this background, there exists a need for a new and improved food dispenser. It is a general object of the present invention to provide a new and improved food dispenser for dispensing dry food.

**SUMMARY OF THE INVENTION**

In a broad aspect, the invention provides a food dispenser for dispensing dry food, the food dispenser comprising: a food receiving module for receiving the food; a metering module for metering a quantity of the food to dispense, the metering module defining a metering module upper wall, a substantially opposed metering module lower wall and a metering module peripheral wall extending therebetween, the metering module upper wall defines two substantially opposed input ports operatively coupled to the food receiving module for receiving the food therefrom, and the metering module lower wall defining two substantially opposed output ports for releasing the food, the output ports being substantially offset from the input ports when the food dispenser is in

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an operative configuration for preventing a direct flow of the food between the input and output ports, the metering module including an impeller having at least one arm defining a vane, the impeller being rotatably mounted between the metering module upper and lower walls for rotation in a plane substantially parallel to the metering module lower wall, the metering module also including a power drive unit operatively coupled to the impeller for selectively rotating the impeller; a discharge module operatively coupled to the output port for receiving the food from the output port and dispensing the food; a directing structure mounted in the food receiving module, the directing structure defining a pair of directing planes diverging from each other and each inclined toward a respective one of the input ports; and an impeller rotation detector operatively coupled to the impeller for detecting a rotation of the impeller when the power drive unit is used to rotate the impeller, the impeller rotation detector including a magnet mounted to the impeller for joint rotation therewith and a magnetic field sensor fixed with respect to the metering module upper and lower walls, the magnetic field sensor being positioned to be substantially in register with the magnet when the impeller reaches a predetermine rotation angle; wherein the metering module is configured and sized to discharge a predetermined quantity of the food when the impeller rotates over a predetermined rotation angle; whereby the impeller rotation detector detects that the impeller has rotated over the predetermined rotation angle after the power drive unit has been energized to detect dispensing of the predetermined quantity of the food.

According to an embodiment, which is particularly suitable for dispensing pelletized dry food, the automatic food dispenser is generally represented by an axially upright, substantially cylindrical assembly comprising a food receiving module, such as a hopper module, occupying the top portion, followed by a metering module occupying the middle portion, and a discharge module occupying the bottom portion.

The food receiving module represents a container or compartment for temporarily storing the animal feed to be dispensed and comprises an open-ended cylindrical body closed at its top end by a removable lid. In alternative embodiments, the food receiving module receives food from a food conveying system, which is particularly suitable in industrial farming contexts.

The metering module is generally represented by an assembly comprising a directing structure on top of a relatively short cylindrical chamber. The cylindrical chamber houses a star-shaped feed impeller and has a power drive unit fastened to its underside to drive the impeller coupled to the output drive shaft of the power drive unit. The cylindrical chamber is further provided with a top input port in communication with the top hopper module, and an output port in communication with the bottom discharge module.

The discharge module is basically a funnel-shaped housing that conveys the dispensed feed to a suitable receptacle such as a feed bowl.

Thus, as the power drive unit is energized and the feed impeller rotates, the cylindrical chamber acts as a feed transfer chamber with the rotating arms of the feed impeller acting as rotating wipers that dispense food material from the gravity urged food falling through the input port to the output port of the chamber.

Furthermore, a magnetic field sensor is fastened at a suitable position to the underside of the cylindrical chamber to detect the passing of a magnetic element, such as a magnet, fastened or embedded in one extending arm of the feed impeller as it rotates.